Diagnosis of Gestational Diabetes Mellitus

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Gestational Diabetes

- What is it
- Diagnosis (+ historical context)
- HAPO study
- Revised ADIPS recommendations
- What should we do?
Gestational Diabetes Mellitus

• “Any degree of glucose intolerance with onset or first recognition during pregnancy.”

• Associated with increased risk of maternal and fetal / neonatal complications*.

• Amenable to treatment (glucose control)
  – Dietary advice
  – Regular fingerprick blood glucose measurements
  – Oral medication or s/c Insulin if needed
Diabetes in Pregnancy - Types

• Pre-existing diabetes (pre-gestational DM)
  – May be type 1 or type 2 diabetes
  – Effects on foetus in first trimester as well as later in pregnancy
  – Identify and treat as soon as possible
  – Not part of today's presentation

• Gestational diabetes
  – Extreme version of expected increase in insulin resistance seen in pregnancy
  – Topic for today
• The leading endocrine condition in pregnancy and continues to rise in the face of the obesity epidemic.
• Pregnancy like a stress-test.
• The insulin-resistant hormones of pregnancy trigger overt hyperglycemia in women with previously undiagnosed insulin resistance and/or decreased pancreatic beta-cell reserve.
Insulin Resistance During Pregnancy

Fig. 1: Usual Changes in Insulin Requirements in a Patient with Type 1 DM
Gestational Diabetes - Risks

- Risk of maternal and fetal complications
  - Preeclampsia, stillbirth, macrosomia (large baby)
  - Early or elective delivery, shoulder dystocia
- Infants at risk
  - Hypoglycemia (high insulin, C-peptide)
  - Hyperbilirubinemia, hypocalcemia, RDS
- Maternal Long term risk
  - Type 2 diabetes
- Possible long-term consequences for the child
  - Obesity and impaired glucose tolerance later in life
Shoulder Dystocia

Large Baby → shoulder trapped during delivery → obstetric emergency + risk of nerve damage
Testing for GDM: “current”

Formulated by ADIPS in 1991 by consensus

2-step process

(i) Glucose challenge test 24-28 weeks
(ii) Proceed to OGTT if elevated
Diagnosis of GDM: “current”

**Glucose challenge test (screen)**
Non-fasting, 50g or 75g glucose
Abnormal if venous PG ≥ 7.8 or 8.0mmol/l respectively

**OGTT**
GDM if: fasting BG ≥ 5.5 mmol/l or
2 hour BG ≥ 8.0 mmol/l (≥9.0 in NZ)
1991

The Diagnosis of Gestational Diabetes

Report of the Ad Hoc Committee to Consider the Criteria for the Diagnosis of Gestational Diabetes in Australia. (The Secretary, Australasian Diabetes in Pregnancy Study Group. 8 Latrobe Street, Melbourne. VIC 3000).

F. Ian R. Martin, Alan Vogue, Richard Dargaville, Christopher Ericksen, Jeremy Oats, Christine Tippett
Royal Melbourne Hospital, and Mercy Hospital for Women and Monash Medical Centre, Victoria.

Consensus statement

Gestational diabetes mellitus -- management guidelines

Linda Hoffman, Chris Nolan and David Simmons


Australian Diabetes In Pregnancy Society (ADPIS)
Diagnosis GDM

Pre-2008 ...
• Lots of “expert” opinions
• Some areas of consensus, many variations
• No RCT’s

Hyperglycaemia and Pregnancy Outcome Study (HAPO)
HAPO

• 23,316 women
• Standard 75g OGTT at 24-28 weeks gestation
• Included in study if: fasting BG ≤ 5.8mmol/l
  2 hour BG ≤ 11.1mmol/l
• Results blinded

Primary Outcomes

• Birth weight > 90th centile (LGA)
• Caesarian Delivery
• Neonatal Hypoglycaemia
• Cord C peptide > 90th centile

Secondary Outcomes

• Early Delivery, need for neonatal ICU
• Shoulder dystocia or birth injury
• Pre-eclampsia, hyperbilirubinaemia
Increased Glucose (all time points) leads to Increased poor outcomes. No obvious “break points”
International Association of Diabetes and Pregnancy Study Groups Recommendations on the Diagnosis and Classification of Hyperglycemia in Pregnancy
GDM diagnosis: IADPSG recommendations

Diagnostic thresholds based on an adjusted OR of 1.75 compared to the HAPO mean (75% increased risk)

Diagnosis of GDM if BG reaches 1 or more of the threshold values

- Fasting BG: 5.1mmol/l
- 1 hour BG: 10.0mmol/l
- 2 hour BG: 8.5mmol/l

(OGTT only – no screening test)
New Criteria

![Graph showing glucose decision points (mmol/L) over time for different criteria: USA C&C, USA NDDG, ADIPS-1998, and ADIPS-2013. The graph includes baseline, 1 hour, 2 hours, and 3 hours time points, with specific values highlighted for each criterion.](image-url)
• Limited interventional data to show changed outcomes
• “75% increase” in risk arbitrary
• Numbers of patient with GDM increased from ~8% to 13-16% (clinical workload issues)
• Significant diagnostic workload issues! (>300,000 OGTTs per year for pregnancy in Oz)
ADIPS 2011

• Planned to adopt HAPO / IADPSG criteria
• Multiple versions of draft Guidelines (>13)
• Liaison with other organisations
  – Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)
  – Endocrine Society of Australia (ESA)
  – Australian Diabetes Society (ADS)
  – Royal Australian College of General Practitioners (RACGP)
  – Australian Diabetes Educators Association (ADEA)
  – Royal College of Pathologists of Australasia (RCPA)

Very limited agreement in 2011 - 2012
Diagnostic Criteria and Classification of Hyperglycaemia First Detected in Pregnancy
3. Gestational diabetes mellitus should be diagnosed at any time in pregnancy if one or more of the following criteria are met:

- Fasting plasma glucose 5.1-6.9 mmol/l (92 - 125 mg/dl)
- 1-hour plasma glucose ≥ 10.0 mmol/l (180 mg/dl) following a 75g oral glucose load*
- 2-hour plasma glucose 8.5-11.0 mmol/l (153 - 199 mg/dl) following a 75g oral glucose load

*there are no established criteria for the diagnosis of diabetes based on the 1-hour post-load value.
“Diabetes in Pregnancy”

Usual criteria for diabetes – onset during pregnancy
Other International Responses

• Support for New Criteria:
  – American Diabetes Association
  – Endocrine Society (USA)
  – European Association for Perinatal Medicine
  – Followed by some or all practitioners in the following countries: Austria, Canada, China, Germany, Greece, Israel, Italy, Japan,

• Lack of Support:
  – American College of Obstetricians and Gynaecologists (ACOG)
  – New Zealand
Australia 2013

Melbourne Meeting

- ADIPS
- IADPSG
- RANZCOG
- ADS
- ADEA
- Australian College of Midwives (ACM)
- RCPA
- SOMANZ
- ESA
- RACGP
- Consumer representative
Welcome to ADIPS

The **Australasian Diabetes in Pregnancy Society** is a professional body established to advance clinical and scientific knowledge of diabetes in pregnancy, to encourage dissemination of this knowledge and to foster collaboration with other regional societies interested in diabetes in pregnancy. It is also involved in the development of health policy regarding diabetes in pregnancy at the National and State levels.
College Communiqués

Diagnosis of Gestational Diabetes Mellitus (GDM) in Australia

For over 20 years, the diagnosis of GDM in Australia has been derived from an ad hoc consensus, based on very limited data available at that time. The landmark observation trial HAPO, 2008 and other important randomised trials (Crowther et al. 2005; Langdon et al. 2009) have led to recommendations for new criteria for the diagnosis of GDM, which have been endorsed by the World Health Organisation (WHO).

Locally, these criteria have been endorsed by the Australasian Diabetes in Pregnancy Society (ADIPS) and the Australian Diabetes Society (ADS) but not by the Endocrine Society of Australia (ESA) or the Society of Obstetric Medicine of Australia and New Zealand (SOMANZ). The result is that there are currently two sets of GDM diagnostic criteria in use – causing significant confusion amongst obstetricians, midwives, pathologists and patients.

On 1 November 2013, RANZCOG convened a multidisciplinary working party to progress the issue of variation in diagnosis of GDM (the Australian Multidisciplinary Gestational Diabetes Working Party). This working party included representation from:

- The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG),
- The Australasian Diabetes in Pregnancy Society (ADIPS),
- The International Association of the Diabetes and Pregnancy Study Groups (IADPSG),
- The Royal College of Pathologists of Australasia (RCPA),
- The Australian College of Midwives (ACM),
- The Australian Diabetes Educators Association (ADEA),
- The Australian Diabetes Society (ADS),
- The Society of Obstetric Medicine of Australia and New Zealand (SOMANZ), and
- Consumer representation.

Last Updated on Wednesday, 23 July 2014 13:14

23rd July 2013

Changes by Jan 2015
13.3 Gestational diabetes mellitus

The ADIPS recommendations are considered controversial both nationally and internationally and have not been endorsed by the RACGP. There is a lack of clinical evidence that intervention is beneficial in the additional women identified by the new screening criteria.
Table 2. ADIPS and IADPSG criteria for the diagnosis of GDM

<table>
<thead>
<tr>
<th>Time</th>
<th>PG:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>(≥5.1 mmol/L)</td>
</tr>
<tr>
<td>1 hour</td>
<td>(≥10.0 mmol/L)</td>
</tr>
<tr>
<td>2 hour</td>
<td>(≥8.5 mmol/L)</td>
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</tbody>
</table>

A diagnosis of GDM is made on one or more of these values.

Gestational diabetes mellitus
Negotiating the confusion

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Background
Recommendations to change the diagnostic criteria for gestational diabetes mellitus (GDM) are controversial. Two sets of criteria are currently in use in Australia, which has led to considerable confusion.
Experts reject new diagnostic criteria for GDM

CATHERINE HANRAHAN

CONSensus in Australia on controversial new international diagnostic criteria for gestational diabetes has been further delayed after a US expert committee rejected the proposed changes.

A US National Institutes of Health (NIH) expert panel met earlier this month to discuss the criteria, releasing a statement stating there was not enough evidence to adopt the single-step fasting glucose test proposed by the International Association of Diabetes and Pregnancy Study Groups (IADPSG).
Surge expected after changes to gestational diabetes criteria

THOUSANDS of IMGs from across Australia will be heading to Melbourne to take their make-or-break registration exams following the opening of the country’s first IMG national testing centre.

The $3.7 million purpose-built facility will be used to assess IMGs’ clinical skills as part of Australian Medical Council’s clinical exams.

The process that IMGs must go through to get registration has been plagued by delays, with many candidates enduring long waits to sit the clinical exams, which currently take place in hospitals.

In 2011/12, there were 7000 applications to take the exams from 3400 IMGs candidates, but only 1500 clinical examination places.

The National Test Centre, equipped with multimedia and "CCTV recording capability", is expected to offer exam spots to a further 1500 candidates every year.

Over time, hospital-based exams will be phased out and all candidates will travel to Melbourne.

The centre is co-located with a "high-security computer test facility" for the AMC’s multiple-choice exams.

Professor Robin Mortimer, president of the AMC, said: "It will enable the assessment of IMGs using the latest technology and best practices outside teaching hospitals.

"The centre will immediately increase the number of IMG graduates eligible for registration in Australia and reduce the delay for candidates waiting to sit the AMC clinical examination."

Dr Elizabeth Lord

OBSTETRIC services will have to come to terms with a surge in women diagnosed with gestational diabetes, following a long-awaited lowering of the diagnostic threshold.

After years of debate, the Australasian Diabetes in Pregnancy Society (ADIPS) has finally published consensus guidelines, which include dropping the fasting blood glucose diagnostic cut-off from 5.5mmol/L to 5.1mmol/L.

A diagnosis can also be made if the one-hour glucose is 10mmol/L or greater, and a two-hour glucose is 8.5mmol/L or greater. The 75g oral glucose tolerance test, meanwhile, replaces the glucose challenge test, which ADIPS said "lacks both sensitivity and specificity".

The changes are expected to see thousands more women diagnosed with gestational diabetes.

Dr Glynis Ross, a Sydney endocrinologist and former ADIPS president, said the impact of the new criteria would differ among local populations.

"I don't think anyone should jump into [using the new criteria] without thinking of the implications," she said.

Women with pre-existing diabetes, and those with complications of gestational diabetes, still needed to be identified and prioritised for treatment and not get "short-changed because resources are spread too thinly", Dr Ross added.

The criteria were first proposed in 2010 by an international expert group, but their adoption stalled in Australia pending endorsement from ADIPS. However, the society has stopped short of recommending specific treatment targets, describing this as an area requiring further research.

Wollongong Hospital in NSW, which adopted the new criteria in January 2011, has seen the proportion of pregnant women diagnosed with gestational diabetes increase from 9% to 13%.

Professor Robert Moses, an endocrinologist at the hospital, said obstetric services had adapted to meet the demands.

"The world hasn’t ended. We’ve been able to accommodate the increased workload very efficiently," Professor Moses said.

See the new guidelines at www.adips.org.
• RCPA considering a request to endorse the ADIPS criteria
Support for the new criteria

For ADIPS Criteria:

• Risk is the same at different times in OGTT
• Matches WHO recommendation
• Matches (some) other parts of the world
  – More likely to have research with these limits
• As treatment target is fasting BSL <5.1 mmol/L, need screening test near this
• As a screening test aim for sensitivity
But

• Many clinicians and clinical groups not supportive, or not ready, or under-resourced

• What should we do?
Responsibility

• Responsibility for clinical decision rests with treating doctor

• Let us support clinical decision making with clear terminology.
Terminology

• **POGTT**: Pregnancy Oral Glucose Tolerance test (different from non-pregnant test)

• **POGTT (1999)**: Original ADIPS 1999 criteria

• **POGTT (2014)**: New ADIPS (WHO) criteria

• Ask doctors to specify which test

• Report test as requested
Reassessment of the new diagnostic thresholds for gestational diabetes mellitus: an opportunity for improvement

- The new criteria result in a significant increase in the number of women diagnosed with GDM.
- Most of the women diagnosed with GDM according to the new criteria have only one elevated BGL.
- Due to the unrecognised effect of the other BGLs being normal, up to 50% of these women are inappropriately diagnosed with GDM as they do not meet the agreed risk threshold.

Michael D’Emden
MJA 2014 (18th August)
Lower treatment targets for gestational diabetes: is lower really better?

It has not yet been established whether implementing lower treatment targets for gestational diabetes will create more benefit than harm. Implementation at this stage is premature.
• More severe cases of GDM identified by both methods

• Other issues include:
  – Testing early in pregnancy
  – 1 or 2 step process
  – Post-partem testing
  – Targets for therapy
  – Improving compliance
  – Optimising dietary advice
Clinical Practice is a combination of:

- Available science
- Interpretation of the evidence
- Balancing competing interests (benefit v costs)
- Timing – enough evidence?
- “Political” agreement
Conclusions

What should we do..

• Our organisations should seek consensus where possible
• We should develop and use clear terminology
• We should liaise with our requesters
• We should be aware of current guidelines (and their uncertainties)

www.adips.org.au